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FILE

INTEROFFICE CORRESPONDENCE

DATE: April 28, 1992

TO: C. D. Reno, Ecology and NEPA Division, Bldg. 80, X8620

FROM: *OE* O. Erlich, Environmental Research and Technology, Bldg. DW-051, 273-6110

SUBJECT: OPERABLE UNIT NO. 1 FEASIBILITY/TREATABILITY STUDY- OE-110-92

The purpose of this memorandum is to follow up our telephone conversation, describe the project to you, indicate the status of the project and answer questions which were brought to my attention by W. A. Moore and K. C. London during the meeting on this project.

According to the Interagency Agreement, Remediation Programs Division (RPD) initiated the Feasibility Study (FS) for the Operable Unit No. 1 (OU1). This FS has a very important element, the Treatability Study (TS), which is done during implementation of FS and reported as an addendum to the FS report. Based on the obtained results from TS testing, technologies applicable to the contaminants of concerns treatment will be evaluated during the FS.

During the FS/TS on OU1 the following activities are planned to take place:

- Work Plan on the Treatability Study will be prepared, which will describe all the activities planned during treatability study implementation;
- Field Sampling Plan will be prepared, which describes the sampling and locations of the soil sampling planned for the treatability study;
- Sampling and Characterization of the sub-surface soil samples will be performed;
- Treatability Study tests will be performed in accordance with the Work Plan for Treatability Study;
- Data Validation and Analysis: All the samples from the treatability testing will be analyzed and characterized accordingly, all the data from this characterization will be validated;
- Report on the Treatability Study will be written, which will include all the data obtained during the tests and all description of these tests as well as findings from the TS.

As identified in my conversation with W. A. Moore and K. C. London and indicated in our phone conversation, necessary soil samples will be collected from the boreholes at OU1, specifically from the Individual Hazardous Substance Sites (IHSSs) 119.1 and 119.2. Both IHSSs are located slightly southeast of the EM subcontractor yard on the slope of the hillside at OU1.

A-OU01-000962

ADMIN RECORD

Locations of these IHSSs are shown on the map and as you can see, they are not located within the flood plain or wetland (see map of the 119.1 and 119.2 IHSSs, attached).

Undisturbed core samples of approximately 3 inches in diameter by 24 inches in length will be collected by the drilling. Estimated maximum of forty core samples (two feet in length each) of subsurface soil will be collected from the 119.1 and 119.2 IHSSs for the characterization and performance of treatability tests. In addition to the undisturbed core samples, bulk samples comprised of drilling cuttings will be collected in one gallon containers. A total of approximately 40 one gallon bulk samples (maximum) from core cuttings will be obtained during the drilling. The soil sampling program is designed to collect adequate quantities of samples to complete a variety of tests as described below.

The subsurface soil samples will be shipped in compliance with DOT and DOE regulations to the IT Corporation Treatability Study laboratory located in the Oak Ridge, TN for the tests. I visited this testing facility last fall together with M. C. Brooks (QA/QC Coordinator for RPD). At that time laboratory had necessary permits and the capability to perform treatability studies on radionuclide contaminated samples (including Pu). Based on my observation of the facilities, each treatability project could be separated from other projects to prevent cross contamination. My intent is to obtain copies of the permits presently existing in the IT treatability laboratory to assure compliance prior to shipment of the soil samples for treatability testing.

At the present time the following tests are planned:

- Physical Characterization of the collected soils, both undisturbed and disturbed will include the following parameters (Note: It is anticipated that not every collected sample will receive a full suite of characterization):

Bulk Density, Soil Texture, Percent Moisture at Saturation, Porosity, Saturated hydraulic conductivity, Field hydraulic conductivity, Transmissivity, Air permeability, Moisture retention curves.

- Chemical Characterization of the collected soils (undisturbed and disturbed) will include the following parameters (Note: It is anticipated that not every collected sample will receive a full suite of characterization):

Total metals, Sulfate, Alkalinity, Sulfur, VOA, Semi-VOA, TPH, TOC, pH, Conductivity, Total Nitrogen, Ammonia-nitrogen, Nitrate-nitrogen, Total Kjeldahl nitrogen, Total phosphate, Orthophosphate, DTPA extractable metals, Organic carbon fraction, Soil lime content, CEC, Soil lime requirements.

- Biological Characterization of the collected soils (undisturbed and disturbed) will include the following parameters (Note: It is anticipated that not every collected sample will receive a full suite of characterization):

Total bacteria, Fungi, Actinomycetes, Methanotrophs, Sulfate reducing bacteria, Denitrifying bacteria.

- Soil Flashing Testing will be limited to completion of batch isotherm studies for a variety of

flushing agents. If results from the batch tests are promising, the most effective flushing solution will be further tested through the completion of a column study. Based on site soil stability conditions, it is anticipated that soil flushing may be a technology which can be only implemented in small localized areas. It is anticipated that a large scale application of the technology could create unsafe slope stability conditions.

- Bio-Treatability Testing the following tests are going to be included:

Microtox testing to determine microbial toxicity. If column studies are completed for soil flushing evaluations, simple benchtop tests to determine biological activity during flushing will be conducted, which will include plate counts of microbial populations and respirometry tests to measure rates of carbon dioxide production.

- Radio Frequency Heating Testing: To evaluate this technology, benchtop tests using bulk samples would be conducted in order to determine the amount of RF energy adsorbed with heating time, temperatures required to achieve product recovery from pressure confined vessel, before and after weight loss for mass balance as well as liquid and vapor recovery, heating rates vs. frequency and power, and impedance measurement for efficient application.
- Soil Gas Extraction: The evaluation of gas extraction (vapor extraction) would be limited to the evaluation of physical tests results as described above, and in the interpretation of field demonstration results from ongoing testing being completed at OU2. No bench scale or field scale testing is planned to be performed for the evaluation of soil gas extraction technology.

All of the above testing will be performed within the normal laboratory operation at the IT Corp. Oak Ridge Testing laboratory.

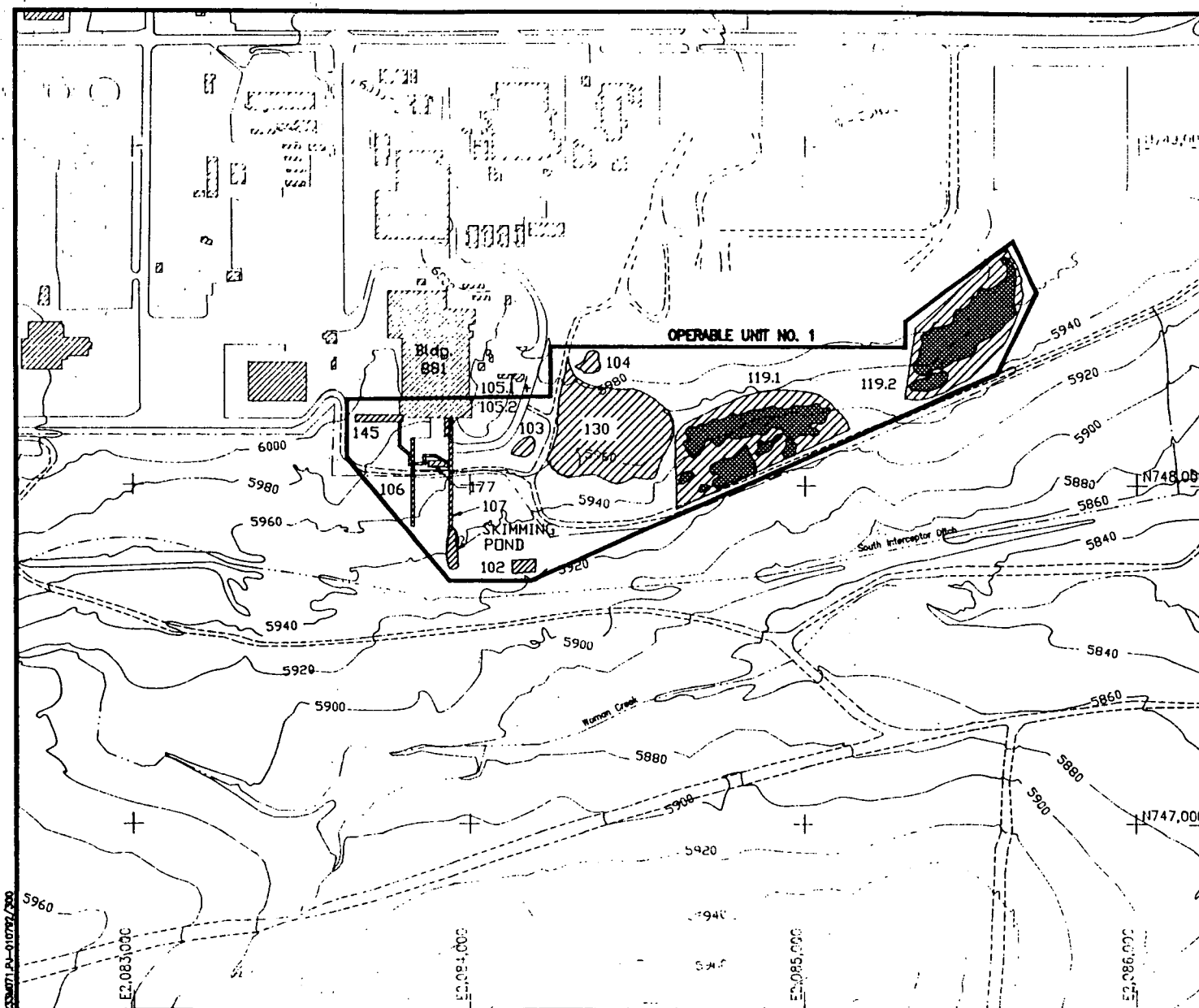
At this time EBASCO/Dames & Moore (the subcontractor on the FS project) is preparing the Treatability Study Work Plan and Field Sampling Plan to cover all activities which will take place during the OU1 FS/TS and as described in this memorandum. I am planning to provide both documents and any others concerning this project to you as soon as they will be available.

If you need additional information on the material concerning this project at any time during the life of it, need to know the status of the project, or have any questions, please let me know.

OExet

cc:

E. A. Dillé
C. B. Gee
T. C. Greengard
K. C. London
D. M. Smith
W. A. Moore



EXPLANATION



Individual Hazardous Substance Site (IHSS)

145

IHSS Designation



Maximum Extent of IHSS 11 Barrel Storage Based on Aerial Photographs dated 04/29/68, 04/10/68, 05/24/69, and 03/30/71.



Scale: 1" = 300'



CONTOUR INTERVAL = 20'

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant, Golden, Colorado
OPERABLE UNIT NO. 1
SURFACE SOIL SAMPLING AND ANALYSIS PLAN

INDIVIDUAL HAZARDOUS SUBSTANCE
SITE LOCATIONS

FIGURE 1-2

February 1972